frontals, forms a much more obtuse angle than in *N. saltianus*, but is not a straight transverse line as in *N. kirkii*. The size of these bones is the same as in the Abyssinian species.

3. The hindmost molar of the lower jaw has a third lobe developed behind with a single enamel fold as in *N. kirkii*.

Fig. 11.

Fig. 12.

Fig. 11. Posterior mandibulary molar of *N. saltianus*.
Fig. 12. Posterior mandibulary molar of *N. damarensis*.

The nasal cavity seems to be as distensible as in the Abyssinian species.

I add the following extract from a letter addressed by Mr. Trimen to Mr. Sclater regarding this animal (d. 20 Oct. 1879) :—

"It was sent to me in March last from Damara Land by Mr. Eriksson, who has lately presented to us a male specimen. The Museum previously possessed a young male, also a Damara-Land specimen, presented by the late Mr. James Chapman . . . The colouring of the male and female is the same; but the adult male has straight horns $2\frac{3}{4}$ inches long, with prominent irregular ridges (seven in one example) circling their basal half. In the young male that we have the horns are 1 inch shorter, and there are only three undeveloped basal ridges.

"Mr. Eriksson informs me that this antelope frequents rocky hills in the vicinity of Omaruru (about a degree north of Walvisch Bay), but is not easily procured, owing to its great agility among its stony haunts."

The typical specimen has been presented by Mr. Sclater to the British Museum.

January 20th, 1880.

Prof. Flower, LL.D., F.R.S., President, in the Chair.

The following report on the additions to the Society's Menagerie during the month of December 1879 was read by the Secretary :—

The total number of registered additions to the Society's Menagerie during the month of December 1879 was 54, of which 2 were by birth, 24 by presentation, 19 by purchase, 1 by exchange, and 8 were received on deposit. The total number of departures during the same period by death and removals was 138.

The most noticeable additions during the month were :—

1. A young pair of Pronghorn Antelopes (*Antilocapra americana*), purchased December 4, being the first pair of this interesting ruminant that we have had together in the Gardens.

$\frac{1}{2}$

J.Smit. del et lith.

Hanhart imp

CHRYSOTIS ERYTHRURA

These animals are in good health and in fine condition, and perfectly tame. The female is hornless. The male has apparently lately shed his horns, as the pair which he bears were quite soft when he arrived.

2. Examples of two rare species of Parrots of the genus *Chrysotis*, namely Bodinus's Amazon (*C. bodini*) and the Red-tailed Amazon *C. erythrura*), purchased December 18, 1879.

Both these species are new to the collection.

Chrysotis bodini was first described in the Society's Proceedings for 1873 (p. 569, pl. xlix.) by Dr. Finsch, from an example formerly living in the Zoological Gardens of Berlin. In May last year I met with the first example I had ever seen of this species in the Zoological Gardens of Amsterdam (see P. Z. S. 1879, p. 438). Since then I have been fortunate enough to secure a specimen of this Parrot for my collection, which I now exhibit. From the make of this skin, it is probable that its *patria* is the Orinoco district of Venezuela, which is rather singular, as the closely allied *C. festiva* likewise occurs in the same country.

Chrysotis erythrura (Plate II.), of which I likewise exhibit an example, was described by Kuhl in 1821, from a specimen in the French national collection, but is so rare that Dr. Finsch was unable to examine an example when preparing his celebrated Monograph. The first examples of it I ever saw were also at Amsterdam last year (see P Z. S. 1879, p. 438). One of the pair there noticed happening to die, Mr. Westerman kindly sent its skin to me for my own collection.

The exact habitat of this *Chrysotis* is still unknown.

Dr. Günther exhibited the drawing of a fish, *Holacanthus tricolor*, obtained on the coast of the island of Lewes, and communicated to him by the Rev. George Gordon, who examined the specimen whilst in a fresh state. Dr. Günther stated that this was the first instance of this fish (which is common in the West Indies) having reached the British coast.

An extract was read from a letter addressed to the President by Col. Heysham of the Madras Commissariat Staff, giving particulars of two cases of Elephants breeding in captivity in which the period of gestation was observed. The first case was described by Col. Heysham as follows :—

Towards the middle of December 1863, when at Thyetmyo, in Burmah, it was reported to me that three wild Elephants (a male and two females) were doing a great deal of damage near Muadung ; and on the 18th of the month, having made all necessary arrangements, I sent some of our Mahouts and Elephants across the river, to try and effect a capture. The following day (the 19th December) I received a report from the Jemadar, that the wild Elephants had joined ours immediately they got near them, and that the male Elephant had covered the four females named in Serjeant Heron's letter. We several times succeeded in fastening ropes

round the male Elephant's legs; but on each occasion he snapped them like so much thread, but did not attempt to leave the place until the 8th January 1864. On that date we got a very stout rope fastened round his hind legs, and although he succeeded in snapping it as he had done the others, he began to think he was in danger, and made off for the jungles. He covered the four females on several occasions between the 18th December 1863 and the day on which he bolted (the 8th January, 1864). The female (Rowell Kutlee) calved on the 3rd of August 1865, which gives nineteen months as the period of gestation.

I very carefully watched these Elephants (knowing them to have been covered), and for the first twelve months saw no such increase of size or alteration of shape as would indicate pregnancy; but in the thirteenth month, 18th January 1865, Serjeant Heron reported to me that two of the Elephants had milk in their breasts, and requested that I would go and see them, as the Mahouts thought they must be going to calve soon. I went and saw the Mahouts draw milk from the two Elephants; and this was the first reason we had to think they were pregnant; but it seems to me to be extraordinary and worthy of remark that the secretion of milk should have commenced so many as seven months prior to calving.

The second case took place at Bellary, in India, and was under the observation of Col. Ostrichsen, when the period of gestation was noted to be the same, viz. nineteen months.

Mr. H. N. Moseley, F.R.S., exhibited some specimens of sections of Corals received from Dr. G. von Koch of Darmstadt, and prepared by a method devised by him, and made the following remarks concerning them and the results attained by them:—

"There has always been great difficulty in determining under the microscope the exact relation of the various components in the cases of animal structures which are composed partly of hard and partly of soft tissues. We can easily prepare fine sections of the hard structures alone by grinding, and we can also, in all cases where these structures are rendered hard by carbonate of lime, decalcify the tissues with acids, and, thus having removed the hard parts, prepare sections with a razor of the soft tissue alone; but we have not hitherto been able to obtain sections in which both hard and soft structures are preserved together *in situ*. The want of some method which should enable such sections as these latter to be made is most strongly felt by any one who is engaged in the investigation of the anatomy of corals. Corals are so completely penetrated by an extremely hard calcareous skeleton that it has hitherto been impossible to obtain sections in which the exact relation of the soft tissues to the skeleton could be made out. Dr. von Koch, who has devoted himself for some years past to the study of coral-structures, has succeeded in devising a method which, though somewhat laborious and tedious, yields exactly what was desired.

"His method was first described in 1874, in a dissertation on the anatomy of the Organ Coral (*Tubipora hemprichii*), published at

Jena[1]; but it is only lately that he has succeeded in preparing sections of corals so perfect as those exhibited.

"The method is as follows:—The corals with all their soft parts *in situ* having been hardened in absolute alcohol, are placed in a solution of Canada balsam in ether, or in gum-sandarach in alcohol, or, better still, of copal in chloroform. After they have become thoroughly permeated by the resinous solutions, they are taken out and dried slowly until the masses become perfectly hard. The hard masses can now be cut into sections with a fine saw, and then rubbed down in the usual manner on a whetstone. The sections can be stained with carmine after being thus prepared, even without the removal of the resin; but usually the tissues are stained in mass before being placed in the resinous solutions. All the soft parts thus become deeply tinged, and stand out in well-marked relief. The sections can then be mounted in fresh Canada balsam[2]. The sections received from Dr. von Koch certainly show a good deal which could not have been exhibited before; and they are interesting, not only as illustrating a new point in the anatomy of corals, but because the method by which they are prepared seems to me to be likely to yield valuable results in the case of many other questions of microscopic investigation. It will be quite easy, for instance, by this means to prepare microscopic sections of injected bone in which the injected capillaries will be shown in their relations to the Haversian systems. Sections also could thus be prepared of the internal ear in which the hard and soft tissues will be preserved together, and the latter would not have been subjected to the deleterious action of the acids which are usually employed to decalcify the cochlea before it can be sliced with a razor. Sections through the undecalcified arms of starfish or crinoids prepared by this method could not but yield most interesting results, and similarly in the case of those Bryozoa which have a calcareous and opaque skeleton. I have sent specimens of *Millepora* and other hydroid corals to Dr. von Koch, and await with great interest the sections which he has promised to cut from these. It is even possible that by this means instructive sections for museum purposes of whole starfish or other animals might be cut and mounted on glass.

"It has hitherto been supposed that the wall of all Madreporarian coralla is developed within the mesodermal layer of the wall of soft tissue of the animal. If this were the case, it would be expected that a simple layer of mesoderm and ectoderm would be found lying externally to the wall of hard tissue in transverse sections of a complete simple coral. Dr. von Koch, however, in his sections finds that this is not the case, but that there exist externally to the calcareous wall what he believes to be the continuation of the mesenteries, and also a series of cavities which are the continuation of the intermesenterial spaces. He thus comes to the conclusion that the wall of the coral-cup is not developed, as supposed, by calcification of the middle

[1] Anatomie der Orgel-Koralle (*Tubipora hemprichii*). Dissertation zur Erlangung der *venia docendi*. Von Dr. G. von Koch. Jena, 1874.

[2] For a detailed account of Dr. von Koch's process see the 'Zoologischer Anzeiger,' Jahrg. 1, p. 36.

layer of the body-wall of the animal, but that it is a secondary structure formed within the body-cavity by the gradual coalescence of the outer extremities of the calcareous septa. In this conclusion he is supported by the fact that in transverse sections of the coral-wall of many species of corals suture-like lines are to be made out, separating the calcareous tissue composing it into a series of masses which are apparently nothing else than the swollen peripheral portions of the septa themselves.

"Dr. Koch, in a paper on the skeleton of corals, lately published in 'the Morphologisches Jahrbuch' [1], exhibits his results in three diagrams. The diagrams represent sections of the same coral, a *Caryophyllia*, at various heights, and are believed by the author to exhibit also the process by which the actual development of the hard skeleton or corallum takes place. In the first the septa are seen quite separate from one another and occupying the centres of the intermesenterial spaces. In the second, the septa have coalesced by means of lateral outgrowths, and a complete calcareous wall is formed with the continuations of the mesenteries and intermesenterial spaces beyond it, these being shown much larger than in nature for the sake of clearness. In the third section, taken towards the bottom of the cups, the tissues external to the calcareous wall have perished and disappeared—this perishing of the lower parts of the soft tissues on the outside of the coral's cup at its base as growth proceeds at the summit being a normal process in the case of many corals, but not by any means in all.

"The calcareous parts are covered everywhere, both according to Dr. von Koch's observations and my own and those of other investigators, with a layer of mesodermal tissue, within the substance of which doubtless they are deposited.

"It will be seen that the outer chambers and mesenteries are found by Dr. von Koch to exist only in the upper part of the coral. In his first diagram there is nothing to be seen but what would have been expected: the exsert calcareous septa rise above the wall of the coral-cup; and thence they only are cut across in a superficial section. In order to explain what is seen in the second section, it may possibly not be necessary to assume that the soft tissues in which the calcareous wall is embedded do not belong to the wall of the animal. What seems to be the case is that the intermesenterial cavities lap over a short distance beyond the edge of the coral-cup, and are thus exposed in section beyond it when the entire coral is cut across. The soft tissues of the disk are to be seen in a living expanded *Caryophyllia* rising far above the summit of the corallum. No doubt, in specimens preserved in alcohol, the tissues are drawn down to a certain abnormal extent on the outside of the corallum as well as into its interior by contraction. The soft tissues in which the calcareous wall is developed may perhaps still be regarded as derived from the body-wall, although they do not quite coincide with the outer portion of it towards the summit of full-grown corals. In many simple corals the

[1] "Bemerkungen über das Skelet der Korallen," Morph. Jahrbuch, Bd. v. p. 316.

outer layer of the body-wall persists as a covering all over the outer surface of the fully grown coral. I have decalcified many such, and never found any trace of mesenteries or intermesenterial canals on the inner surface of this layer.

"The question is to a certain extent one of nomenclature. At all events Dr. Koch's results are very interesting; and further research by use of his method in the case of other corals must lead to valuable results.

"With regard to the development of the coral-wall from outgrowths of the ends of the septa, it must be noted that Prof. Lacaze-Duthiers found, in the case of the Mediterranean coral *Astroides calicularis*, that the wall is developed in the young coral from calcareous spicules quite distinct from those composing the septa. Dr. Koch, however, considers that the mode of development may be quite different in the case of the Perforate Corals, to which group *Astroides* belongs, from that occurring in Imperforata. Further, however, many very young corals of the genus *Flabellum* were dredged by H.M.S. 'Challenger.' In these the wall appears as very distinct from the septa, and there can be little doubt that both the horizontal wall at the base and the lateral wall are structures developed apart from the comparatively insignificant septa. In *Flabellum* the sutures in transverse sections of the coral appear to correspond with the centres of the septa themselves, and not with the intervals between them as in *Caryophyllia*; and in the young corallum the wall is seen to be doubled in as it were opposite the lines of attachment of the septa to it.

"Corals are so difficult as subjects of investigation that our knowledge of them is as yet very imperfect indeed, and it becomes more and more evident that the careful investigation of a few forms will not suffice to elucidate the others; they must all become the objects of much patient research."

The Secretary exhibited an egg of the Mooruk (*Casuarius bennetti*) from the island of New Britain, sent to him for examination by Capt. F. J. Evans.

The egg was obtained by Admiral Hoskins, late Commodore on the Australian Station.

A communication was read from Mr. F. Moore, F.Z.S., containing an account of the Indian genera and species of the Lepidopterous subfamily Ophiderinæ.

This paper will be published in the Society's 'Transactions.'

The following papers were read :—

1. Remarks on some Species of the Genus *Tyrannus*. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.

(Plate III.)

Mr. Ridgway has lately contributed to the 'Proceedings of the United-States National Museum' an excellent paper on the genus *Tyrannus*[1]. As I have a good series of examples of the species of this genus in my collection, and have paid some attention to the subject I beg leave to offer the following remarks on Mr. Ridgway's paper.

Mr. Ridgway's views as to the limits of the genus *Tyrannus* coincide very nearly with mine as expressed in my 'Catalogue of American Birds' and in the 'Nomenclator Avium Neotropicalium.' Mr. Ridgway allows 13 species of the genus *Tyrannus*, while Mr. Salvin and I in the last-named work only recognized 11. Mr. Ridgway's two additional species are *Tyrannus apolites* (Cab. et Heine) and a supposed new species which he proposes to call *Tyrannus luggeri*. As regards the first of these, it was omitted from our list, because it seemed probable that it might have been founded on a young individual of one of the races of *T. melancholicus*. And after again studying the original descriptions, I have no other reasonable conjecture to offer on the subject. Concerning *Tyrannus luggeri*, however, I can give some more certain information, Mr. Salvin having received from Mr. Ridgway in exchange an example of this species, which I now exhibit. As will be seen, *Tyrannus luggeri* of Demerara is identical with the bird called in my collection *Myiozetetes sulphureus* (Spix)[2], and is, I think, better referred to the genus *Myiozetetes*, though a somewhat aberrant member of it, than to *Tyrannus*.

There remain, then, 11 species of *Tyrannus*, which both Mr. Ridgway and I acknowledge as veritable species of the genus; and, moreover, our names for them are fortunately the same, except as regards Mr. Ridgway's *T. carolinensis* and *T. dominicensis*, which in conformity with the Stricklandian Code I call *T. pipiri* and *T. griseus*. But I am more fortunate than Mr. Ridgway in having in my collection examples of *T. albigularis* and *T. niveigularis*, two species which are unknown to him. A few words upon these somewhat rare birds may be useful to Mr. Ridgway and to other ornithologists.

Tyrannus albigularis, Burm. Syst. Ueb. ii. p. 465, though most nearly related to *T. melancholicus*, is, I think, quite a distinct species. My example of it is an adult male, obtained by Natterer near Goyaz in Brazil, in July 1823. At first sight the pure white throat and want of any greenish tinge on the yellow breast render it easily distinguishable from *T. melancholicus*. Above the plumages of the two birds are more nearly similar, although the back of *T. albigularis* is decidedly of a more yellowish olive. The tail (fig. 1), is also

[1] "Descriptions of new Species and Races of American Birds, including a Synopsis of the Genus *Tyrannus*, Cuvier. By Robert Ridgway," Proc. U.S. Nat. Mus. i. p. 166 (1879).

[2] Cat. Am. Birds, p. 220.

3/4

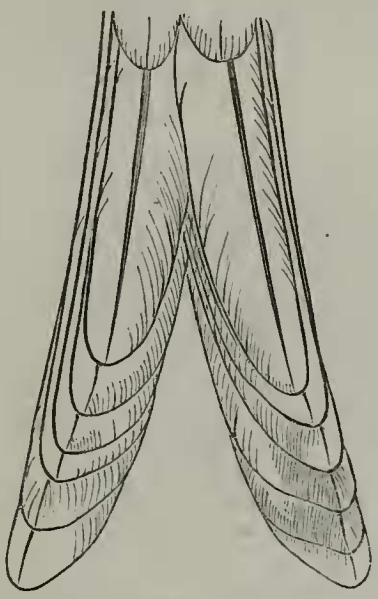
J Smit. lith

Hanhart imp

TYRANNUS NIVEIGULARIS

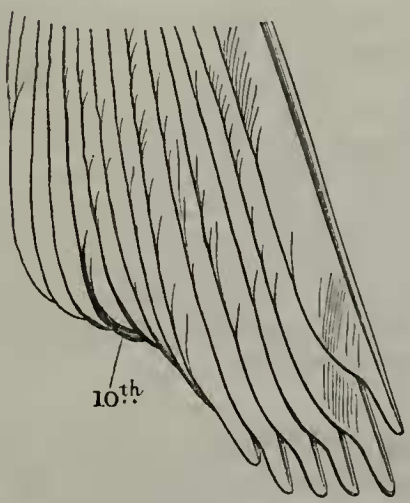
more deeply forked than in *T. melancholicus*. The primaries are acuminated, much as in *T. melancholicus* (see fig. 2); but the sixth

Fig. 1.



Tail-end of *T. albigularis*, from above.

Fig. 2.



Wing-end of *T. albigularis*, from below.

primary is not quite so sharply pointed, and is shorter. The bill is also smaller in *T. albigularis*.

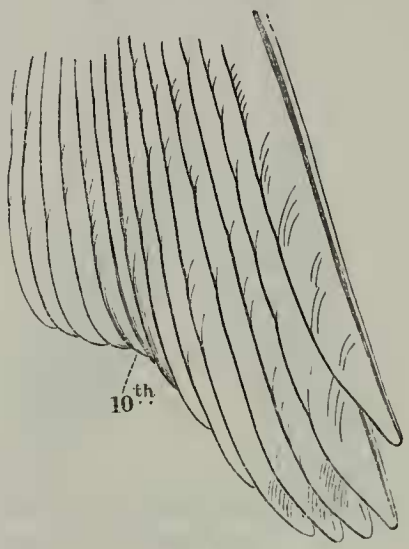
As that most accurate observer Natterer designated this species by a MS. name in his Catalogue[1], I think there can be little doubt of the validity of *T. albigularis*[2].

Tyrannus niveigularis, mihi (P. Z. S. 1860, p. 281), of which I

[1] See Pelzeln, Orn. Bras. p. 118. [2] Cf. Finsch, P. Z. S. 1870, p. 572.

exhibit the typical specimen (Plate III.), is not very nearly allied to any other species of the genus, and must be pronounced to be a most distinct and well-marked member of the group of true *Tyrannus*. I cannot much improve upon my published diagnosis of this bird, but may add, in reply to Mr. Ridgway's remark, that the tail-end is nearly

Fig. 3.



Wing-end of *T. niveigularis*, from below.

square, the two outermost rectrices being not more than ·1 inch shorter than the middle ones. The cinereous plumage above is tinged with olive. The tail is uniform black, with only very narrow light margins at the extremities. The five outer primaries (fig. 3) are slightly attenuated at their extremities, but not any thing like to the extent that prevails in *T. melancholicus* and its allies.

Besides the single example of *T. niveigularis* in my own collection (obtained by Fraser at Babahoyo, Ecuador), I have only seen two other skins. These are both in the collection of Messrs. Salvin and Godman. One of them was procured by Mr. C. Buckley at Intaj in Ecuador; the other was purchased from a dealer, out of a collection coming from the same country.

2. On a new Species of Roller (*Coracias*) from the Zambesi. By Roland Trimen, F.L.S., F.Z.S., &c., Curator of the South-African Museum, Cape Town.

[Received January 9, 1880.]

Dr. B. F. Bradshaw, who has lately returned to Cape Town after six years' travel in the interior, formed a considerable collection of bird-skins, chiefly in the neighbourhood of the Zambesi at the junction of the Tschobe, and succeeded in bringing it down in good condition. As he proposed to dispose of the collection, he permitted

me to select for the museum a small series of the rarer species represented; and amongst these is a single specimen of a Roller which appears to be very distinct from any of the described species. I give the following description of this interesting new form, and will append to it the notes on the bird which have been kindly furnished to me by the discoverer.

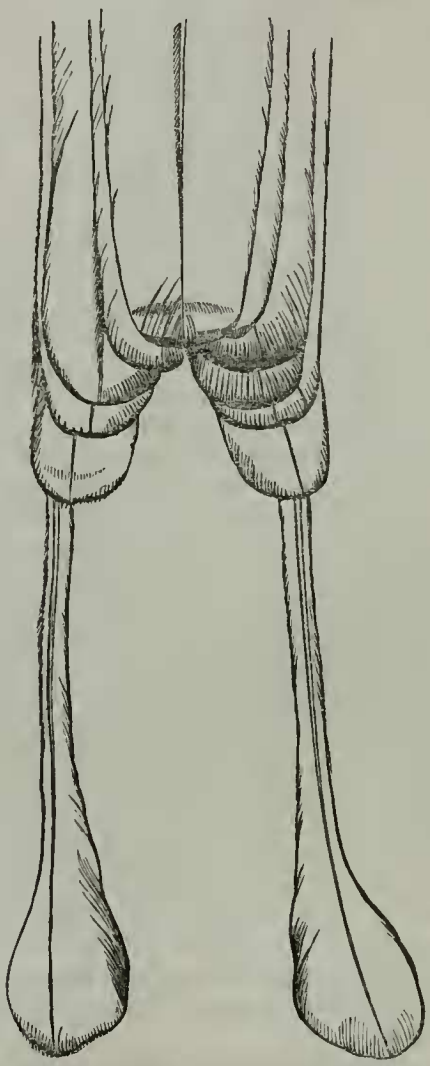
CORACIAS SPATULATUS, sp. nov.

♂. Forehead and superciliary stripe rather broadly white; top of head, neck, and back dull pale greyish-green mixed with cinnamon-brown, the latter colour predominating on the scapulars and lower part of the back; rump and upper tail-coverts ultramarine-blue, the coverts richer and deeper in colour; chin and a spot at base of lower mandible whitish; throat, breast, belly, thighs, and under wing- and tail-coverts pale bright verditer-blue, varied on the lower throat and breast by lilacine cinnamon-brown webs, leaving the shaft-stripes of the blue; cheeks and ear-coverts mixed lilac and verditer-blue; sides of neck coloured like the back; sides of breast dull sandy-brownish with bluish-white shaft-stripes; upper wing-coverts ultramarine, except a short central band of cinnamon-brown lesser coverts, which is edged on both sides by a few ferruginous-violaceous feathers; primaries black on inner webs, ultramarine-blue on outer webs, their basal portion on both webs (but only on the inner web of the first primary) pale bright verditer-blue; secondaries coloured like the primaries, except the last three, which are cinnamon-brown. Tail forked, the feathers increasing in length from the two middle ones, which are the shortest; the two outermost feathers are prolonged (their inner web being abruptly much narrowed) $2\frac{1}{2}$ inches beyond the next feathers, and their extremity is rather broadly spatulated by the gradual widening of the inner and abrupt widening of the outer web; these spatulate feathers are light verditer-blue as far as their sudden narrowing, and thence wholly black (including the terminal expansion); the next feather on each side is verditer-blue, broadly tipped with blue-glossed black, which extends a good way along the inner web; the next is similarly coloured, but the dark portion extends much further towards the base; the following feather is dark-blue throughout, except that its base and a very thin edging of its outer web are verditer-blue; and the two middle feathers are wholly black except for a slight gloss of blue on each side of the shaft; on the underside of the tail the colouring is paler, and the dark parts of the feathers are shot with bluish-green. "Bill black; feet greenish-yellow; iris yellowish-brown" (*B. F. Bradshaw*).

Total length in inches (including long tail-feathers) $15\frac{1}{2}$; length of culmen $1\frac{1}{4}$, of folded wing $6\frac{1}{2}$, of central tail-feathers $5\frac{1}{4}$, of outermost tail-feathers $8\frac{1}{6}$.

This fine Roller is in some respects intermediate between its two nearest allies, *C. caudatus*, L., and *C. abyssinicus*, Bodd., but is at once distinguished from them both by the spatulate form of the elongated outermost tail-feathers. Apart from this peculiar character,

the tail differs markedly in form from those of the two species named, being forked and having its two middle feathers the shortest, while that of *C. caudatus* has the feathers generally of about equal length, and in that of *C. abyssinicus* the two middle feathers are the longest. This furcate shape of the tail makes the produced outermost feathers of *C. spatulatus* look shorter than those of *C. caudatus*; but in fact they are just about the same length. (The corresponding feathers in *C. abyssinicus* are $2\frac{1}{2}$ inches longer.) The bill and feet are



Terminal portion of tail of *Coracias spatulatus*, nat. size.

comparatively slender, the former being rather shorter than in *C. caudatus*. The upper-surface colouring much resembles that of *C. caudatus*; but the head and neck are not nearly so green, being almost uniform with the upper back; the wing-coverts are ultramarine-blue throughout except for a narrow cinnamon-brown bar, instead of

ultramarine-blue at the top succeeded by verditer-blue; the last three secondaries are uniform sandy-brown instead of fuscous and sandy-brown shot with greenish; in the tail the two middle feathers are black instead of dusky bronze-grey, and the feathers next to them on each side ultramarine glossed black instead of verditer-blue clouded with blue-grey; and the white forehead and eyebrows are very much broader and more conspicuous. The under surface colouring is deficient in the rich lilacine-purple which adorns the throat and entire breast of *C. caudatus*, though it exhibits traces of a similar hue on the sides. In comparison with *C. abyssinicus*, the upper surface differs more markedly than it does from that of *C. caudatus*, for in *C. abyssinicus* the head and neck are greenish-blue sharply separated from the uniform rufous-brown back; but on the under surface the coloration is the same, except that *C. abyssinicus* does not present either the lilacine or brownish which vary the sides of the face, throat, and breast in *C. spatulatus*. The tail-feathers (with the exception of the two middle and two outermost) have their colours just reversed in relative position, *C. abyssinicus* presenting pale-blue feathers with dark-blue bases, and *C. spatulatus* feathers pale blue at the base, but blue-black at their extremities.

Dr. Bradshaw informs me that *C. spatulatus* was not seen far from the Zambesi except once or twice, when he noticed it at about 80 miles distance to the south of the river. The species chiefly frequents the so-called "Sand-veldt," a tract of heavy sand-ridges, keeping about the tallest timber. In the winter months it makes its appearance in small companies of from four to ten or a dozen, but is out of plumage and very scarce during the rainy season, *viz.* from November to April. In flight and action these birds resemble the other Rollers, and are usually difficult to approach. They have a most peculiar harsh cry, which differs from that of the other species, and when once heard is easily recognized on repetition. The male specimen brought down was shot on the 23rd May, 1878, on the western boundary of the Leshumo valley, through the whole length of which water only runs during heavy rains. All the specimens seen had the extremities of the long tail-feathers expanded into the battledore form.

I have never before seen any example of this *Coracias* in the numerous collections made in the interior. The species is probably limited in its range and may thus have escaped notice; while it is not unlikely that the less observant collectors may have passed it by as *C. caudatus*.

3. Note on some Points in the History of the Synonymy of Echini. By Alexander Agassiz, F.M.Z.S.

[Received January 10, 1880.]

The 'Proceedings' of the Society for March, May, and June, 1879, contain three short articles on Echini, by Mr. F. J. Bell, of the British Museum (see pp. 249, 436, and 655). As these articles are

evidently the forerunners of others, it would be premature to enter here into any discussion of the criticisms of Mr. Bell on the characters of this or that species; yet the tone adopted by Mr. Bell from the outset towards me calls for some counterstatement on my part, not on matters involving difference of opinion, but on questions which underlie the method I have adopted in the 'Revision of the Echini.'

In the first of the two articles (pp. 249 and 655) which alone concern us at present, it seems unnecessary to notice such quibbling as occurs on p. 252 in reference to the synonymy of *Echinus* and *Brissus*. When we come, however, to the omission of a synonym, this is of course, as Mr. Bell says, a more serious matter. I am accused (p. 252) of omitting in the synonymy of *Brissus unicolor* the name *E. unicolor*, Gmel., which I quote in the Chronological List, while I introduce in the synonymy *E. ovatus*, Gmel.

This charge I will answer by quotations from the 'Revision' (pp. 28 and 87):—

"In giving the synonymy of species which have become historical, ... it becomes a necessity to cull the long list of quotations misnamed synonyms, and to separate what is merely bibliographical from what constitutes the history of the name and the history of the species." . . . . .

"Not to introduce too many doubtful synonyms, a general concordance of all the names given to Echini, including MS. names mentioned, is added, where doubtful synonyms will be found recorded by referring them to some species of this Revision."

If Mr. Bell will read the first page (p. 87) of the synonymy of the 'Revision,' and then look in the Synonymic Index (p. 187) under *Echinus unicolor*, he will find the very reference to the synonymy of *Brissus unicolor* on p. 97, which he states I have omitted.

He next says, p. 252, "the date of the specific term *unicolor* being then 1788, what is the date of *carinatus*?" But the date of *unicolor* is not 1788; it is 1734. Mr. Bell will find in the Chronological List, on p. 36, under "1734 Klein (continued)," *Brissus unicolor*! This means, as Mr. Bell can ascertain from the Revision (p. 87), that I had seen the original specimen of Klein's *Brissus unicolor*! [see Introd. Revision Echini, p. ix]. On one side therefore we have the statement of Mr. Bell that the date of *unicolor* is 1788, and on the other Klein's original of *B. unicolor* dating back to 1734, which leaves no choice of date.

I have throughout the Revision recognized the same principle with regard to original or authentic specimens, and quote again from it ['Revision,' p. 13]:—"As far as the question of priority of the specific name goes, the only guide I shall take is an original or authentic specimen . . . . . the oldest name shall be preserved to the exclusion of all others, if the change is based upon authentic specimens, and not simply upon a figure, a guess, which may or may not be true." Carrying out the above views, I ascribed *carinatus*, of which I had seen an authentic specimen, to Lamarck, and placed *Echinus carinatus*, Gmel., in the Synonymic Index (p. 183), referring it to *Brissus carinatus*, Gray (p. 96).